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The Enhanced CANDU 6™ Reactor

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EC6™ - CANDU™ Medium Size Global Reactor

The Enhanced CANDU 6 (EC6) is AECL's 740 MWe class heavy water moderated pressure tube reactor designed to provide safe, reliable nuclear power

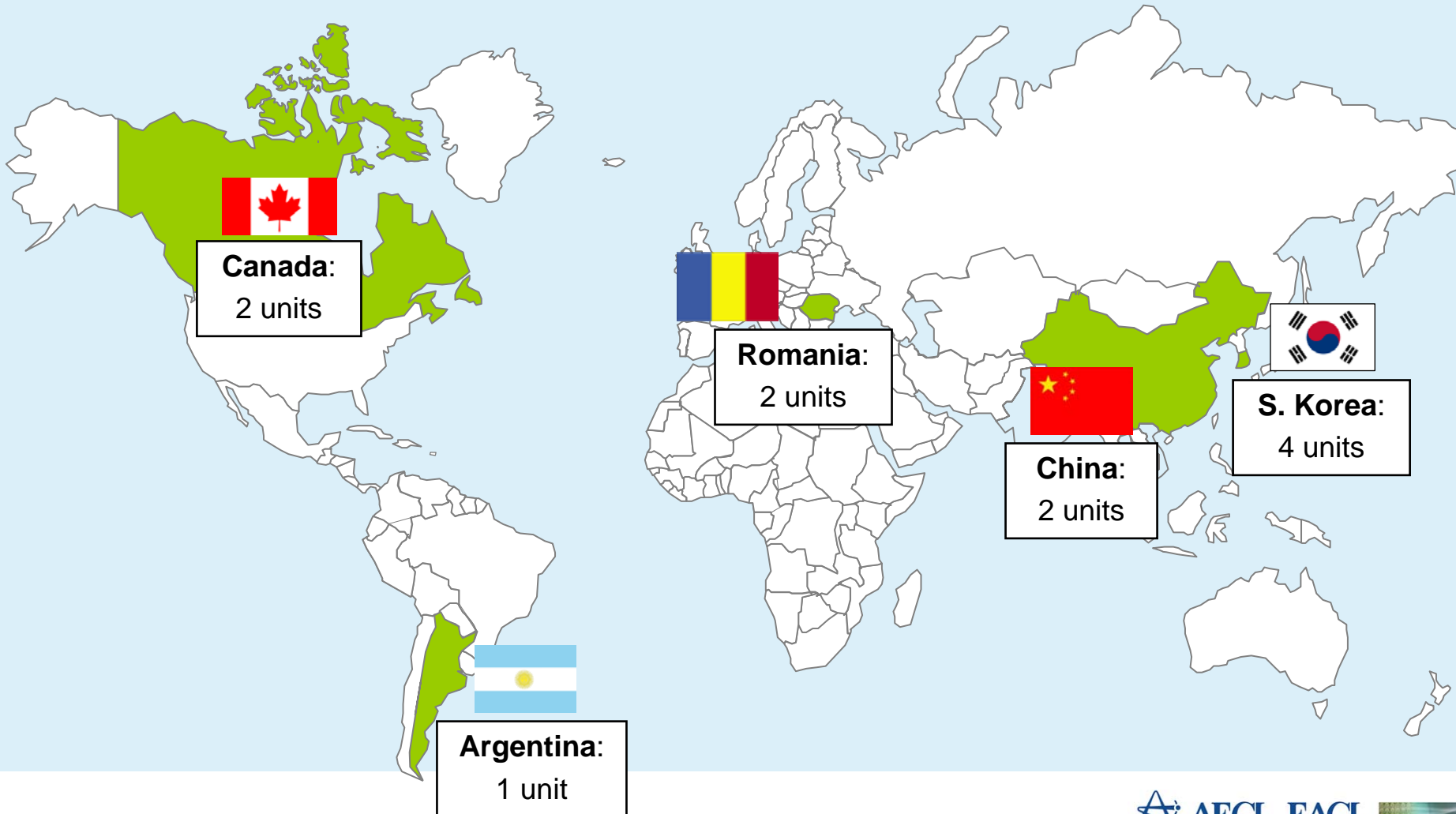


Proven, Strong Foundation

- The EC6 design benefits from the proven principles and characteristics of the very successful CANDU 6 reactor. The EC6 offers reliability, flexibility in operation to load follow and the ability to be connected to most grids of most countries
- Proven CANDU reactor strengths include:
 - ✓ **Powered by natural Uranium**
 - ✓ **Ease of installation with modular, horizontal fuel channel core**
 - ✓ **Separate low temperature and pressure moderator**
 - ✓ **Reactor vault filled with light water which surrounds the core**
 - ✓ **On-power refuelling**
 - ✓ **Two independent, passive, safety shutdown systems**
 - ✓ **Reactor building access for on-power maintenance**

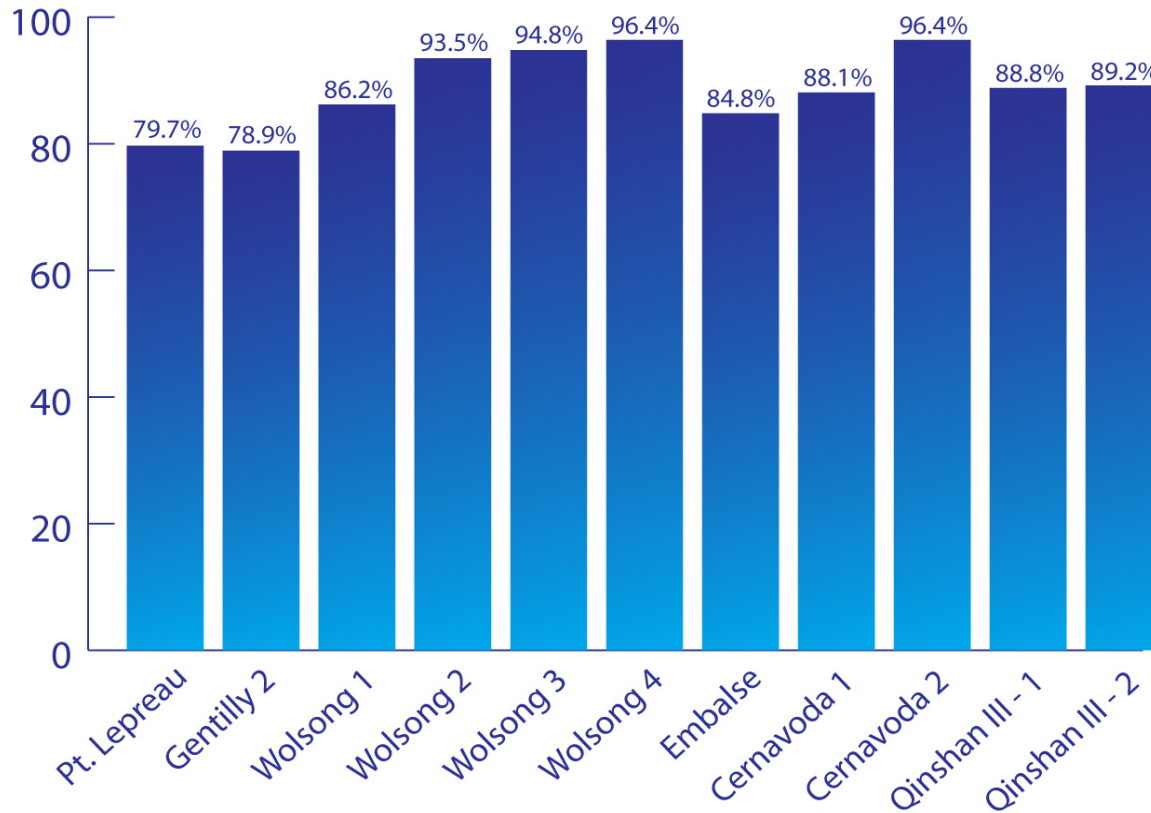
CANDU 6 Plants Around the Globe

EC6 is based on AECL's extremely successful CANDU 6 design



CANDU 6 Performance Excellence

- There are 11 CANDU 6 reactors operating worldwide with an average lifetime capacity factor of over 88% and with over 150 years of safe operation



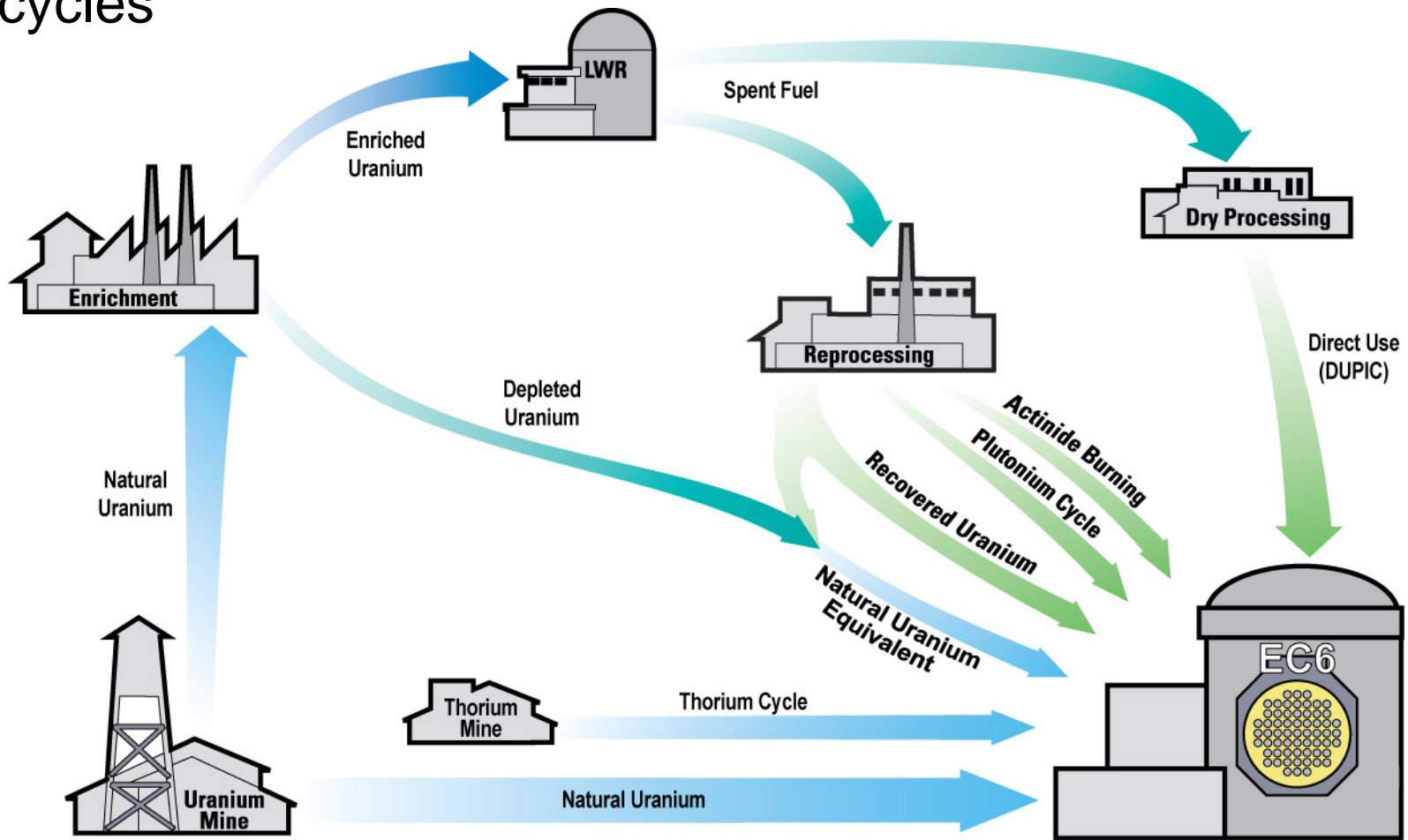
CANDU Owners Group Inc, Dec-31-2008

EC6 Highlights

- Major improvements incorporated in the EC6 design include:
 - ✓ **Improved power plant output of up to 740 MWe gross**
 - ✓ **60 year plant life with replacement of major components at around midlife**
 - ✓ **Natural uranium & flexible fuel capabilities**
 - ✓ **Target capacity factor of 90%**
 - ✓ **Reduced project schedule of 57 months from 1st concrete to in-service**
 - ✓ **More robust containment and increased passive safety features**
 - ✓ **Enhanced severe accident management with additional emergency heat removal systems**

Fuel Cycle Flexibility

- The EC6 can accommodate a variety of fuel types and cycles



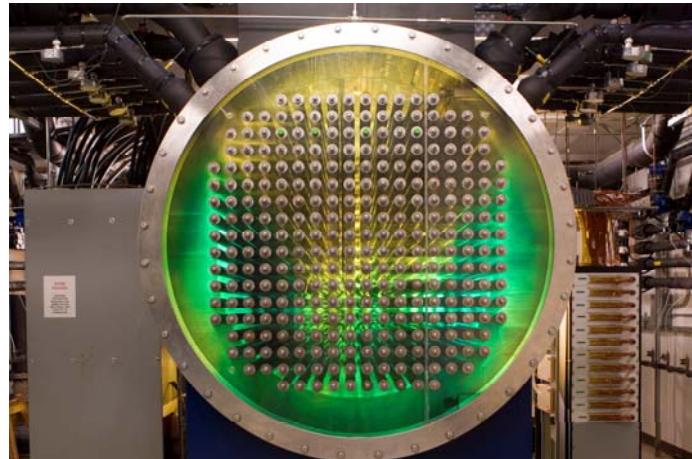
Design Enhancement Basis Principles

- **New design enhancements based on direct feedback and interaction with operating CANDU utilities and current Safety/Licensing requirements:**
 - ✓ **Improved shutdown performance for improved Large LOCA margins**
 - ✓ **Improved fire protection systems (e.g. upgraded firewalls and penetrations, detectors, etc)**
 - ✓ **Additional reactor trip coverage**
 - ✓ **Automated and unitized back-up standby power and water systems**
 - ✓ **Additional design features to address severe accidents and aircraft crashes through provision of steel lined containment and thicker containment walls**
 - ✓ **Simple Plant Operability and Maintainability**
 - ✓ **Optimized Plant Maintenance Outages**
 - ✓ **Modern Computers and Control/Display Systems**

Gen III Criteria

The EC6 reactor has been studied against the following criteria

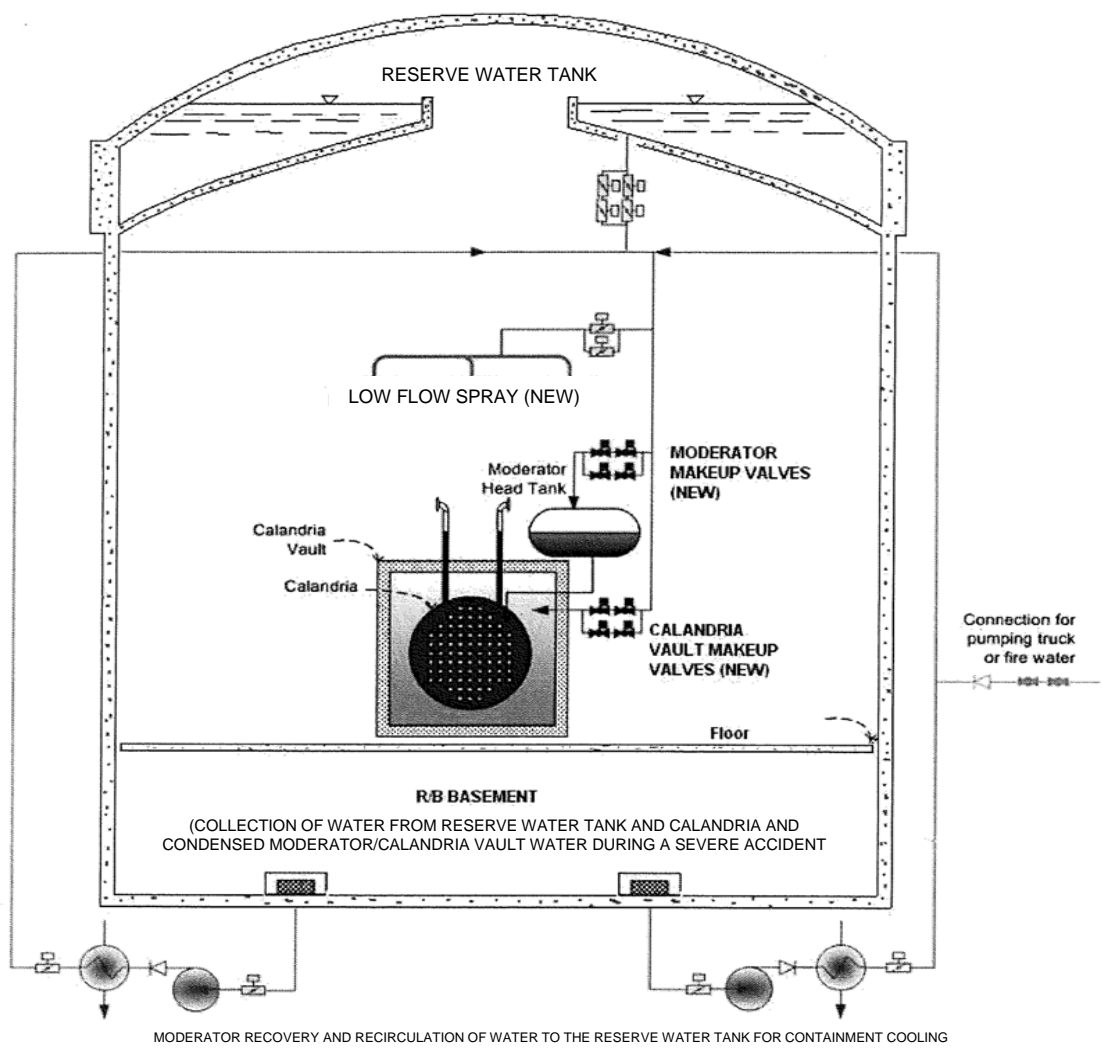
- ✓ Simplification
- ✓ Design Margin
- ✓ Human Factors
- ✓ Safety
- ✓ Design Basis vs. Safety Margin
- ✓ Regulatory Stabilization
- ✓ Standardization
- ✓ Proven Technology
- ✓ Maintainability
- ✓ Constructability
- ✓ Quality Assurance
- ✓ Economics
- ✓ Sabotage Protection
- ✓ Good Neighbour



Safety

- Passive Autocatalytic Recombiners (PARs) for long-term hydrogen control
- Calandria inlet nozzle/outlet port configuration reconfigured to improve flow distribution inside the Calandria to increase moderator subcooling
- Improved feeder material to increase operating life
- Emergency Heat Removal system for operation in case of severe accidents and provide additional heat sink capacity
- Structures designed to protect against external threats
- Automated Emergency Power Supply (EPS) Diesels
- Emergency Control Centre (EmCC) and expanded Safety Parameter Display System (SPDS)

Containment and Severe Accidents



Emergency Heat Removal System

MODERATOR RECOVERY AND RECIRCULATION OF WATER TO THE RESERVE WATER TANK FOR CONTAINMENT COOLING

Operation & Maintenance

- 18 month maintenance outage frequency (target)
 - Electrical, water, & air supplies for on-power maintenance
 - Improved on-power testing
 - Reduced testing requirements by providing redundant equipment
- Enhanced shielding
 - <50 mSv/yr to any individual
- Equipment & systems design optimized to meet revised maintenance cycles

Constructability

- 57-month schedule from first concrete to in-service
- Second unit in-service 6 months later



- Advanced construction methods
 - Open-top using VHL crane
 - Modularization
 - Prefabrication
 - Concurrent / parallel work
 - Advanced work management tools



Comparison of Key Enhancements

	CANDU 6*	EC6
Containment/Liner	1.07m epoxy-lined pre-stressed concrete	1.8m steel-lined with stronger concrete
Control Systems	DCC & traditional control layout	DCS with human factors engineering
Computer Maintenance	Digital computer based	60% cost reduction
Pressure Tubes	4.2mm	~12.5% Thicker
Feeders	Carbon Steel	Improved corrosion resistance (> Cr %)
Performance Factor	88.8% LCF fleet average	90% (target)
Power	680 MWe	Up to 740 MWe**

*Based on CANDU 6 at Point Lepreau

**Dependant on site conditions

Conclusions

- **The Enhanced CANDU 6 (EC6) Reactor:**
 - ✓ **Is based on proven CANDU 6 design & technology**
 - ✓ **Incorporates extensive utility feedback**
 - **Improved maintenance & operability**
 - ✓ **Delivers enhanced safety**
 - ✓ **Uses natural uranium fuel & is flexible to alternatives**
 - ✓ **Offers up to 90% capacity factor & 60 year design life**
 - ✓ **Is economical and competitive**
 - ✓ **Meets current International & Canadian standards**
 - ✓ **Available for deployment readily**

 **AECL EACL**

